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Original Article.

HIGH OR SUPRAPUBIC OPERATION FOR STONE IN THE BLADDER.

SURGICAL CLINIC

BY PROF. W. H. PANCOAST, M. D.

[Reported by Mr. Charles A. Read, Student of Junior Class, Medico-Chirurgical College of Philadelphia.]

A GENTLEMAN was brought into the clinic room from the hospital, on a stretcher, who is a farmer, Mr. C. W., in Bucks County, of this State; age, seventy-two years. Prof. Pancoast had examined him two weeks previously, before the large clinic class, several doctors being present, and found a very large stone in the bladder. This he said must have been forming for several years, and the patient should have attended to it sooner. The bladder was so contracted upon the stone that it was impossible for him to seize it, even with his smallest lithontriptic, so as to crush it. The jaws of the instrument could not be safely and widely enough opened to get a good hold of the stone without lacerating the bladder. The instrument would seize on several sides, but slip off without crushing it. The operator said this probably was a very large, hard stone, and oval or round, as the beak of the lithontriptic, while seizing it in different directions, would glide or slip off. The Professor said then that it was often a very nice question to decide in regard to a large stone, whether it was better to crush or perform a lithotomy. In bad cases, such as this, the shock was great in each case. He said: "I am examining this patient for the first time. I find him very feeble, with ossified or calcareous arteries, a feeble heart, a large prostate gland, with possibly much (venous) engorgement, an inflamed and most painful bladder, from the long pressure of stone; in fact, it is now no bladder at all, but an expansion of the urethral canal, not holding any water, which is its polite function to do, so that he can mingle with and enjoy the pleasures of society. The urine, as you see, flows continually. His dusky skin and confused mind show, I fear, that his kidneys are in a very bad condition. As you know from what I have taught you, any impediment to the discharge of urine, whether a stricture, or a foreign body, or a stone large enough to obstruct the flow, will back up the urine in the kidneys, and produce a distension of the pelvis and calices of the kidneys, the uriniferous tubules, and produce congestion of the glomerules of Malpighii. This may lead to inflammatory changes in the central part of the kidneys, a non-elimination of urea from the blood and uræmic poisoning. The patient is so weak, with such a feeble pulse, that I had the ether given, as you noticed, very carefully, as usual,

and only a small quantity. He cannot bear any further interference to-day without danger to his life. He suffers such exquisite pain, that if I could have crushed it, as I have often done in similar cases, I would have done so, to lessen the tension of the bladder, and get away all I could at one sitting by crushing and evacuating the debris, so as to give him some ease. As he can bear no more, with the consent of his physician I will send him again to his bed in the surgical ward of the hospital. He will be put under careful treatment, suppositories of opium in the rectum, aided by hypodermic injections of morphia and atropia as needed, soothing medicines for the bladder and kidneys, demulcent drinks and full doses of quinine, stimulating and easily digested nourishment, as broths, milk punch, etc."

This Wednesday, February 22nd, 1893, Prof. Pancoast brought the patient again before the class as above mentioned. He stated that it was two weeks since the students had seen the patient. He was so slow in recovering from his trip to the hospital, and weak, and his urine loaded with albumen, that for the first ten days it was thought he could not live, and he suffered such exquisite pain that his family feared to move him. But finally the last three days he has rallied, and to-day is his best day. He is anxious for some relief from his pain, and for the operation. The Professor said he preferred to operate upon patients when they had commenced to improve, and not when they were sinking. In the first place there was much more chance for success as they were mounting in the scale of health. By removing the surgical difficulty from which they were suffering and were being dragged down, they would improve still more rapidly; as a balloon, mounting in the air, will rise more rapidly as the sand bags are emptied out. The patient is anxious for the chance of help and relief from pain that an operation may give him, and will sink again and die rapidly if not relieved of his pain; he is entitled to have this chance. The patient was lifted carefully from the stretcher to the bed, his body well protected by covering, a hypodermatic injection of whisky and strychnine given, and etherization commenced. Prof. Pancoast told Dr. Bryan to have the ether given very carefully, and Dr. Gilmer to secure assistance to administer it, and to attend to nothing else. Dr. Gilmer constantly gives ether in his surgical clinic, and does so very successfully. The operator said he had given ether directly or by an assistant constantly since it was first introduced, in his father's practice and his own, several thousand times, and had never lost a case from it, but he was watchful and prudent. When a patient was fully etherized and stertorous, he always stopped the administration of ether, and waited until the effects had worked off somewhat before resuming it. If the patient is very violent under it, the Professor lets him come to himself and then resumes its administration.

When the ether is kept up continuously after the patient is etherized, the head becomes saturated with the vapor, and the patient becomes *ether-logged*. This phrase expresses the condition, the Professor said, like a piece of timber water-logged and sodden. The patient does not rally so well, sometimes not at all, especially if there is congestive disease of the kidneys; and the condition is ascribed to the shock of the operation, when it is from a too great prostration of the nerve centres by carbonizing the blood to excess. While the patient was being etherized, the final aseptic preparations were made. The instruments were boiled, the abdomen and thighs washed again with the usual solution of bichloride of mercury, and the Professor donned his long, white linen operating gown, which differs from those of his assistants by buttoning in front.

While the patient was being etherized the professor gave an anatomical description of the position and relations of the bladder, and said that he had decided to perform the high or suprapubic operation; that the stone was too large to crush, as there was no room for manipulation with a lithontriptic in the bladder, too large to be brought out by the perineal section under the pubis, for this would require lithoplaxy, cutting into the bladder and then crushing it. This is a favorite operation with the Professor, and he had recently in the clinic performed this successfully on an Italian merchant, with a stone too large to bring through the prostate and out under the pubis. He performed the lateral operation,

put gently in his lithontriptic, crushed the stone in four pieces and removed them quickly and gently, occupying a very short time (it seemed only two minutes), followed by a rapid and complete recovery.

The operator also said that in this case, the kidneys being so diseased, the least shock possible must be inflicted on the bladder. As the arteries were ossified, the prostatic veins engorged by the long irritation of the enlarged prostate gland, cutting through the perineum was also very dangerous. The shock would be great, the hemorrhage might prove exhausting, and the little ossified arteries would gape and not bear well the ligatures. So he decided to perform the suprapubic operation, which avoids the other dangers, permits the complete removal of the stone, and with aseptic precautions and care in not injuring the peritoneum will be the safest operation in this case. The lecturer stated that he had performed a great many operations for stone, as it was one of his specialties. He had patients with stone at all ages and in both sexes. When the stone is friable, the bladder and kidneys in good condition, he preferred lithontripsy, washing out the bladder with the evacuating catheter and bag. This he prefers to do gently; treating the bladder as gently as he would handle an eye. He does not cut the meatus of the urethra unless it is absolutely necessary. It is the end of the squirt, he says, and needed to be narrow to make the manly bow in urinating. He does not like Prof. Bigelow's large instrument for evacuating; it makes the operation too rough and requires the incision generally of the meatus urethræ. He showed a small lithontriptic for children. His favorite operation in a good perineum with healthy kidneys is the lateral or bilateral perineal section. He has several stones he has thus removed. This lateral method drains the bladder so well and is such a natural incision, only requiring a knowledge of the anatomy and some skill, not to cut the prostate gland too far back, so as to avoid cutting the deep prostatic layer of the perineal fascia, which is continuous with the pubic fascia, and will cause peritonitis by infiltration of the urine; also to avoid the artery of the bulb.

The patient being now ready, lying easily at full length on the table, the operator first passed a sound through the urethra into the bladder. Then making a deep, quick incision downwards through the median line, from midway between the umbilicus and top of the pubis, he was through the abdominal wall and his aseptic hand in the cavity. The bladder, he stated, was contracted on the stone, and as far below the pubis as the superior ligament would permit. Now we saw the advantage of the sound being in the bladder. With his other hand pushing the sound gently, he pushed up the bladder, which was lifted up as much as the rubber water bag in the rectum could do. The operator said this facilitated very much his seizing the top of the bladder with his strong tooth forceps. Then incising the top of the bladder carefully with a new knife, from in front of the peritoneum to below the pubis, keeping back the peritoneum so as not to injure it, he passed the left index finger into the bladder and felt the stone. The operator said it was large, smooth and rounded generally, with some very rough points on it. With the right hand, the operator passed in a medium sized pair of stone forceps, his left holding the top of the bladder open and steady with the forceps. The stone was so imbedded and large that it would not come out readily, and the opening in the top of the bladder had to be carefully enlarged; and as the bladder was contracted and low down in the pubic cavity, this required some minutes of nice manipulation, and some time was required. Then the operator drew out a large oval stone, looking like a potato, smooth in parts, and with some rough knobs on it. The stone weighed 4⅝ ounces troy, and measured about 2x3 inches. The incision through the linea alba looked very small for the exit of such a large stone.

The operator washed out the bladder aseptically; and then pushed in gently through the wound, and through the incision in the anterior top part of the bladder, quite a large piece of iodoform gauze, which filled up the external wound completely, and came over the hypogastric region.

The patient rallied from the operation, and after being carefully wrapped up was transported to his bed in the hospital. The Professor said he would be treated

very carefully, anodynes and nourishing food given him, as he could bear them, and drainage made continually by the capillary action of the iodoform gauze, and that he would report the result of the case; that the patient would be relieved wonderfully of his pain, and it only remained to see how he would rally from the uræmic poisoning, and diseased kidneys.

Ten days subsequently Professor Pancoast reported the wound almost entirely healed. The operation had been of great benefit to the patient, but he feared a bad result in regard to his kidneys.

NOTE.—The patient recovered from the operation, but ultimately died from uræmia.

CLAM JUICE.—SALICYLIC ACID AS A FOOD PRESERVATIVE.

BY WILLIAM F. WAUGH, M. D.

PHILADELPHIA, PA.

SEVERAL years ago, my attention was directed to the value of clam-juice, as a food in certain conditions. The first was cancer of the stomach; and for this hint I am indebted to Dr. Thos. C. Stellwagon. In three cases of gastric cancer, and many of ulcer, I have found clam-juice relished and retained when all other food provoked nausea. In fact, in all cases attended with anorexia of the most severe type, it has become very customary to prescribe clam-juice. A gentleman, aged seventy, suffers with chronic cystitis and retention. Periodically, his stomach becomes disordered; he loathes the sight of food, vomits whenever he forces food down, and brings up large quantities of mucus. This condition is very familiar to those who have treated chronic cystitis. When it occurs, this patient is at once ordered bottled clam-juice and milk, equal parts; a teacupful to be taken, hot, every four hours. Next day he is able to eat any ordinary food.

For the disordered stomach following an evening's drinking, no remedy equals the clam-juice. A few cups, taken hot, without milk, will relieve the headache, settle the stomach, and put the victim in condition to attend to his ordinary avocations.

I have employed clam-juice largely in the treatment of opium and cocaine habitues. When the daily allowance is being cut down, a distressing state of debility occurs. Sometimes the nerves, relieved of the drug, become exceedingly sensitive, and the slightest causes occasion severe neuralgic attacks. For this pain the clam-juice often acts as a prompt and efficient remedy. For the insomnia of these subjects, it is also one of the surest remedies. Indeed, there are few cases of insomnia, except from plethora, coffee or over-eating, that will not be relieved by hot clam-juice better than by hypnotics. In convalescence from acute fevers, in the low stages of any acute affection, and wherever a quickly assimilable form of food is required, clam-juice is pre-eminently the choice. I have never seen an analysis of it; but, judging from its effects as seen clinically, it contains a form of phosphorus that is absorbed and transformed into vital force with unexampled rapidity.

SALICYLIC ACID.

In his work on fever, Hare tabulates eighty-seven cases in which toxic symptoms followed the administration of salicylic acid or its derivatives. Seven deaths occurred; the smallest quantity taken being 120 grains salicylate of sodium in six doses, two hours apart. Of the others, the smallest quantity causing toxic symptoms was fifteen grains of the soda salt, in one dose; while the largest single dose recorded was 825 grains of the acid, taken by mistake by a woman twenty-eight years old, suffering with "pleurisy, fever." The most common symptoms noted were collapse, cold sweats, giddiness, headache, and especially nocturnal delirum.

Unfortunately, at the time these cases were recorded, no distinction was made between the pure salicylic acid and the commercial. The latter contains impurities to which most of the toxic symptoms may be referred. Dr. Henry Leffmann kindly furnished me the following note.

"Prof. Charteris, of Glasgow, has carried out a series of experiments on rabbits, which may be summarized as follows:

"Salicin in thirty grain doses, natural salicylic acid in ten grain doses, and sodium salicylate (from the natural acid) in thirty grain doses, have no deleterious effects on rabbits weighing two and one-half pounds.

"Artificial salicylic acid in ten grain doses, and sodium salicylate (from the artificial acid) in eighteen grain doses, cause the death of rabbits weighing two and one-half pounds. Even the best specimens of the acid (artificial) sold as 'chemically pure,' proved fatal in fifteen grain doses to one rabbit. The dangerous effect of the artificial acid is due to the presence of creosotic acid, parahydroxybenzoic acid, and hydroxyisophthalic acid, from use of impure materials or errors in manufacture."

As a preservative, Kolbe found one part of the acid, added to 2500 of milk, prevented souring.

Bucholz stated that fifteen parts to 10,000 prevented the development of bacteria in ordinary organic mixtures. Prideaux found that one part added to 2000 of urine preserved it from change for two weeks; while one part to 1000 preserved it indefinitely.

Wernitz studied the action of salicylic acid on the digestive ferments. He found that one part of the acid in 7600 arrested the action of emulsin, one in 5100 arrested diastase; one in 1250, ptyalin; one in 9000, pancreatin; one in 2600, myrosin; one in 166, invertin; one in 250, pepsin, and one in 333, rennet. These considerations probably influenced the French government in interdicting the use of this acid, as its prolonged use, even in very small doses, is dangerous.

In Massachusetts the use of salicylic acid as a food preservative is forbidden, absolutely, in any quantity, great or small; and severe penalties are placed on dealers who keep salicylated articles in stock.

Hehner[1] states that salicylic acid is employed as a preservative for Bavarian beer; five grammes per 100 liters, for domestic, and twenty grammes for export.

In times gone by, when the causes of the decomposition of food were not understood, the discovery of a preservative was doubtless an achievement; but now, when we not only know these causes, but can prevent decomposition indefinitely by exclusion of germs, or by cold, without the addition of any kind of foreign material, we surely should make an attempt to discriminate between processes of preservation. Milan, Buenos Ayres, Berlin, Holland, Italy, Spain, Austria and Germany, have forbidden the use of salicylic acid in milk, beer, wine or other food products. Hehner closes his excellent article by urging the entire prohibition of all preservatives.

With this opinion we cannot but agree. No substance capable of preventing germ development in food, can fail to be injurious to the animal economy, when taken daily for long periods. Even were this not the case, the use of such preservatives should be forbidden, because they cultivate a tendency to carelessness in handling the food products concerned. If those engaged in their preparation realize that they must use only perfectly wholesome articles, and that the result depends on the perfection of their processes, the product will be what it should be; while if carelessness in the selection, cooking or bottling, may be covered up by antiseptics, the result will not be as good an article. In a large canning establishment, the manager requested permission to use salicylic acid, as some of the stock had been returned in bad order. Investigation, however, showed that the articles had been allowed to lie about until decomposition had set in, before they were sealed hermetically. Thus, the employees desired to cover up a monstrous example of carelessness, by the use of this antiseptic.

In regard to clam-juice, the use of salicylic acid is based on the following argument: This valuable food is prepared for the sick and sold in bottles. All that is required is to heat it to the proper degree, which can be done by the nurse, with a spirit lamp. For its convenience, the bottled juice is therefore employed almost exclusively. There is no difficulty in so preparing it that it will be perfectly sweet on opening the bottle, but as this may be used at intervals for perhaps a week, it is difficult to prevent decomposition after the bottle has once been opened. This, and the dispensing of clam-juice at soda-water fountains, is held to justify the use of salicylic acid; as without it toxic substances far more dangerous than the acid may develop in the clam-juice.

The quantity used is 4 ounces to 28 gallons of the juice. This makes less than

[1] The Analyst, Dec. 1890, p. 223.

one-third of a grain of acid to the half-ounce. From this small quantity it is evident that no toxic symptoms could result, the minimum dose recorded as causing them being fifteen grains. But even with this small dose, if repeated frequently, there would be an injurious influence upon the digestive function, especially if the impure commercial acid were employed. The high price of the natural acid has prevented its general use; but we now have a synthetic acid superior to the natural. Schering, of Berlin, supplies salicylic acid and sodium salicylate, snow-white, of an agreeable, non-acrid taste. Of several samples obtained from city druggists, not one compared favorably with Schering's; all, even Merck's, having the pink tinge and acrid taste denoting impurity.

If salicylic acid be used at all in clam-juice, it should be only under the following conditions:

1. Nothing but the purest acid should be used.

2. The presence of the acid, and its quantity, should be distinctly stated on the label, so that the customer may know what he is getting.

3. The salicylated juice should only be dispensed with the sanction of the physician, who is the best judge of its effects in each case.

4. For general use, a non-salicylated article should be furnished.

It would be much better if the manufacturers were to put up the clam-juice in small bottles, each containing no more than is ordinarily used in a single day. This could easily be kept sweet in an ice-chest, even in the hottest weather; and thus the only excuse for the use of salicylic acid would disappear.

A NEW TREATMENT FOR TUBERCULOSIS.

By SAMUEL G. DIXON, M D.

[Professor of Microscopical Technique and Histology, and Director of the Bacteriological Laboratory, Academy of Natural Sciences. An Address delivered before the Students of the Medico-Chirurgical College of Philadelphia, April 7, 1893.]

YOUNG men, this intrusion upon your regular curriculum of medical study, just now, when you are all hard at work preparing for arduous examinations, may not permit you to welcome the remarks I have to make regarding my new treatment for tuberculosis of the skin. However, as I was once in just such a perilous situation, I will be exceedingly brief, and therefore trust you will take a hearty interest in this, the most momentous medical subject of the day. This expression may sound exaggerated until you call to mind the fact that one-seventh of the deaths in the human family are caused by tuberculosis. For this reason I have devoted some years to the study of this heretofore almost unconquerable malady.

I expressed, in the *Medical News* of October 19, 1889, a probability of producing immunity by inoculations of an involution form of the tubercle bacillus. While engaged in that work, I discovered a toxic substance produced by or in the tubercle bacillus, which gave most satisfactory results when injected into animals suffering with tuberculosis. (Proceedings of the Academy of Natural Sciences, Philadelphia, November 18, 1890.)

This substance, since called tuberculin, was introduced into the human economy by Prof. Koch, the results of which are yet sub judice. Personally, I have not yet felt justified in using tuberculin in man. My hesitation is due to its extremely toxic nature, and from the fact that I gravely suspect the micro-organism to be capable of spore formation. If so, it is possible that it would grow when introduced into a predisposed tissue, while it would appear dead when placed in the circulation of healthy animals or those with artificially produced tuberculosis. This may account for the general miliary tuberculosis sometimes caused by its introduction into the circulation of man.

Having these possibilities before me when working with tuberculosis on the lower animals, my object being not only to cure consumption but also to produce immunity, I recognized the fact that immunity exists in animals which have not had tuberculosis nor been inoculated against the same. At least this would appear to be so in man when we consider the facts that one-seventh of our people have tuberculosis, while it is fair to believe that nearly seven-sevenths are exposed to the poison. This, most likely, is due to the difference in the constituents of the animal body, and yet we have been quite unable to recognize either by a microscopic or chemical examination any difference between susceptible and non-susceptible tissues. Therefore, we

are, while in this state of ignorance, obliged to look around for something that will indicate a possible difference and follow out any idea that has the least promise of rendering the body unsuited for the tubercle bacillus, or in other words for that which will change soil suited for its propagation and growth, to soil in which such growth cannot be effected. With this in view, and recognizing that animals leading a sedentary life and often fed on concentrated food stuff, frequently have sluggish livers; I proposed to throw the bile salts into the cellular tissues of tuberculous animals. The first results of this experiment I referred to as early as November 18, 1890, in the procoedings of the Academy of Natural Sciences of Philadelphia. The taurocholate and glycocholate of soda were used, principally the latter, as it is much more abundant in many non-susceptible animals than in animals susceptible to tuberculosis. These salts also should help in the assimilation of fats and consequently aid indirectly in the formation of new and healthy tissue. While these investigations with many others, which I will not now mention, were being worked out, I was looking around for pathological conditions not usually accompanied with tuberculosis, such as erysipelas and others. Gout, however, impressed itself very favorably upon my mind as a condition that might be temporarily produced without doing injury to the patient, and possibly change the soil of tuberculous man, as gout and tuberculosis do not often occur together.

The first results, based on the theory of the gouty condition being antagonistic to tuberculosis, were obtained in a few small animals referred to in my article entitled, "Reaction of the Amide-Group upon the Wasting Animal Economy," TIMES AND REGISTER, September, 1890. In these experiments I used each member of the group, creatin, urea, uric acid, etc.

Since my first publication of the use of taurin, creatin, urea, uric acid, etc., I have obtained some most flattering results. The action of taurin and urea on tuberculosis of the skin will be illustrated by a case, which I will show you to-day as it is under treatment by this group. Some of the patches of Lupus are practically dead. However, before showing you the case, I desire to call your attention to the fact that since I began to use urea, a vegetable substance which might be considered a modification of urea, has come into use abroad as a therapeutic agent for tuberculosis, and according to the reports is promising in its action. From the fact that it so nearly resembles that which I have used, with more or less success since 1891, I see no reason why it should not produce the desired change. My results coupled with the favorable reports regarding the action of this vegetable product, Thiosinamin, confirm the belief that the truth of my theory of changing the soil with these substances is now about to be confirmed, and we will be able from this on to treat successfully a large proportion of the cases of tuberculosis of the skin and possibly of the lungs.

While my theory has suggested the use of what I believe to be a remedy for tuberculosis in at least one of its forms, further scientific and empirical experience will likely explain the exact action of these substances upon the tissues affected with tuberculosis.

DIURETIC AND PURGATIVE WINE.

By JOSEPH JONES, M. D., LL. D.

NEW ORLEANS, LOUISIANA.

IN dropsy and general anascarca arising from organic lesions of the heart, and in Bright's disease of the kidneys, we have employed with benefit, the following diuretic and purgative wine:

℞—Fluid extract of jalap, . . . f ʒ iij
Fluid extract of squills, . . f ʒ iij
Fluid extract of jaborandi, . f ʒ j
Fluid extract of digitalis, . . ♏ xxx
Nitrate of potash, ... ʒ iv
Angelica wine, ... O. ij
M. f. s. a.

Dose.—One tablespoonful every three hours, until ordered to be increased.

This combination has in my hands acted as an efficient diuretic, reducing the greatly distended patient to the normal proportions. The angelica wine is a pleasant and supporting menstruum for the diuretics and purgatives.

Of course, I have employed many other diuretics and purgatives in the treatment of the various forms of dropsy, and at the present time desire simply to commend the above formula to the attention of my fellow practitioners of medicine, whose experience will be read with interest.

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CHICAGO'S WATER SUPPLY.

THE *Lancet* of April 8, contains the report of its special sanitary commission of inquiry concerning the Chicago water supply. The report first speaks of the discharge of sewage, some fifteen per cent. going into the lake, but the bulk being pumped into the canal that carries it into the Des Plaines river, finally discharging into the Mississippi.

The lake water is pumped into the city mains, and goes directly to the consumer, without subsidence or filtration. Domestic filters are in common use; universally in the hotels. The lake water examined proved to be surprisingly free from chemical evidence of the sewage pollution. Save for suspended matter, it was much superior to that of the ordinary London water supply. Properly filtered, it is fit for any and every domestic purpose; unfiltered, it is unfitted for drinking, on account of the suspended matter. Hence, the security depends entirely on the care with which the water is filtered. The real danger, in the committee's opinion, lies in the use of impure ice, by which the water is rendered dangerous, after filtration. Visitors are advised to use no water that has not been boiled and filtered, that all possible risk may be avoided. These are the conclusions, supported by the details of the work, which seems to have been carefully and thoroughly performed. The investigation was most timely; and its results will go far to relieve intending visitors of their apprehensions. Coming from a disinterested source, the report has a value that would not accrue to the same investigation, if made by any native authority.

The report bears the ear-marks of its truly British origin, in such matters as making the Chicago water empty into the Missouri river, instead of the Des Plaines. Fortunately, the display of ignorance is merely geographical; the scientific work is irreproachable.

DR. DIXON'S REMEDY.

KOCH'S great discovery of tuberculin followed in due course, one year after Samuel G. Dixon had demonstrated the same thing. After the smoke of battle cleared away, the scientific world was found to have reached the position taken by Dixon originally. He now presents the results of a further investigation, in the shape of a remedy for tuberculosis in man. The remedy has been administered to one patient of the writer's for six weeks; and, *pari passu* with improvement in all other respects, the temperature of the patient has gradually sunk to normal. We, who have steadfastly upheld Professor Dixon's claims from the first, may be pardoned for some elation over the way in which our faith is being justified.

MILK.

MR. ABBOTT discusses the milk question from the standpoint of one who has studied it for years. His conclusions are based on actual observa-

tions and data furnished by the highest living authorities. Against this logical presentation of the facts, his opponents have as yet presented the public nothing but arrogant assumptions, gross personal abuse, and unsupported assertions; whose extravagance leads one to believe that these gentlemen cannot possibly have made a study of their subject.

Still, the purity of our milk supply is too important a matter to be neglected, and deserves the attention of our legislatures. Dr. P. D. Keyser, of the Board of Health, has made the suggestion that skim milk should be dispensed in blue cans, so as to be distinguished even by the most ignorant. A distinction should also be made between ordinary skim milk and separator; and, if possible, when milk falls from natural causes below the average, the customer ought to know it. In fact, every effort should be made to secure to the customer just what he is paying for. Further than this, the hygiene of farm-yard and dairy, as Mr. Abbott remarks, are of greater import than the ratio of milk solids. Curiously, neither of the milk bills introduced deals with the causes that were in operation when Vaughan discovered tyrotoxicon. That was due to the milking being done at noon, and the milk sent by wagon, in the heat of the day, to the hotel where the epidemic occurred.

Special Article.

MILK LEGISLATION.

VARIABILITY OF MILK SOLIDS—HONESTY NO SAFEGUARD—NO SANITATION IN "LEGAL LIMITS."

UNDER existing laws in the City of Philadelphia it is unlawful to sell, or have in possession for sale, any impure, adulterated or unwholesome milk. The addition of water or ice, or of any other substance or thing, constitutes an adulteration. And milk produced from cows fed upon distillery waste or upon any substance in a state of putrefaction or rottenness, or upon any substance of an unwholesome nature, or that has been exposed to, or contaminated by the emanations, discharges, or exhalations from persons sick with any contagious disease, or milk from tubercular cows, is declared to be impure and unwholesome.

The burden of proof is put upon venders of milk; they being obliged to ascertain the character of the milk in all these particulars so far as it is possible so to do. The laws now in force do not, however, fine and imprison defendants if they prove to the satisfaction of the court that they could not possibly obtain said information. It is this little shred of justice that is so much objected to by the inspecting officers, who want that juries shall be obliged to convict all that are accused, irrespective of actual guilt or innocence, citing as an excuse for their request that, in parts of our country, such stringent legislation exists. It is true that some very unwise and unjust laws affecting the sale of milk have been enacted in a few of our states, and such legislation is in striking contrast with the intelligent, equitable and efficient laws that are in force in Europe. Unfortunately the legislators who enacted these laws had ill advisers, by whom, being misinformed and misled, they were induced to enact such measures as their prompters thought would be most convenient for enforcement, without the slightest regard for justice or scientific truth.

The milk acts alluded to contain three features that have been steadily rejected by other enlightened governments as unjust, unintelligent, and not economic: First, in that they render parties accused of a penal or criminal offense liable, irrespective of intent or of a guilty knowledge; Secondly, in that they establish legal limits for solids in milk, though a natural product of extreme and unavoidable variability; at the same time making the limit so high as to place producers of and venders in milk entirely at the mercy of the inspectors; and Thirdly, in that they have in some instances prohibited the sale of skim milk, and in others so encumbered its sale by unreasonable and difficult requirements as to occasion a curtailment of its use, or its practical prohibition.

The imposition of fine and imprisonment because of an ignorance of facts, not an ignorance of the law, is a hardship under any circumstances, but in the case of milk it is doubly so, because being of a perishable nature, and there existing a necessity for serving it while fresh, it is practically impossible to secure an analysis in advance of sale. To thus require an impossibility, and to punish for non-performance, is tyranny.

Persons charged with robbery, incendiarism, counterfeiting, and the like, are, when upon trial, given the benefit of every doubt, and are considered innocent until proven guilty. But this special milk legislation reverses this order, and, though the penalties are the same as for felonies, yet the defendant is held to be guilty until he proves his innocence and is then further wronged by being denied the opportunity to do so.

The British Adulteration Act under which milk prosecutions are conducted in Great Britain provides, "That no person shall be liable to be convicted under either of the last foregoing sections of this Act in respect of the sale of any article of food, or of any drug, if he shows to the satisfaction of the justice or court before whom he is charged that he did not know of the article of food or drug sold by him being so mixed, colored, stained, or powdered, as in either of those sections mentioned, and that he could not with reasonable diligence have obtained that knowledge."

The Massachusetts *general* Adulteration Act introduces the word "knowingly," for the protection of *innocent* holders for sale of adulterated foods or drugs, but in its special milk act this word is stricken out.

The Pennsylvania general Adulteration Act provides that, "If any person shall sell or expose for sale the flesh of any diseased animals, or any other unwholesome flesh, knowing the same to be diseased or unwholesome, or sell or expose for sale unwholesome bread, drink, or liquor, knowing the same to be unwholesome; or shall adulterate for the purpose of sale, or sell any flour, meal, or other article of foods, any wine, beer, spirits of any kind, or other liquor intended for drinking, knowing the same to be adulterated; or shall adulterate for sale, or shall sell, knowing the same to be adulterated; any drugs or medicine, such person so offending shall be guilty of a misdemeanor, and upon conviction be sentenced to pay a fine not exceeding one hundred dollars or undergo an imprisonment not exceeding six months, or both, or either, at the discretion of the court."

Yet in the Pennsylvania Milk Act affecting cities of the second and third classes, the word "knowingly" is stricken out.

Why these invidious distinctions,—not requiring knowledge where it is possible to obtain it, and requiring knowledge where it is impossible to obtain it? Is the purity of a drug of less moment than that milk should be free from adulteration? The adulteration of milk is to be condemned as a fraud, and when proven, should be punished in like manner as is other food and drug adulterations.

In the U. S. Department of Agriculture, Division of Chemistry (Bulletin 25, p. 32), appears the following quotation from Dr. Faville: "While we do not like the idea of buying water for milk, it is surely no more repugnant than buying sand for sugar, or any other adulterated food."

Nearly all the milk inspection in vogue in the United States begins and ends with the determination of the total solids, the solids fat and the solids not fat. Yet the amount of solids in milk has little if any influence upon the public health. Starved or underfed cows are now almost unknown, and, climatic conditions aside, the per centum of solids found in milk varies almost entirely according to the breed of the cow and the time that has elapsed since she was last fresh.

In the preparation of food for infants milk is generally used simply as a base, to which are added sugar and cream together with, in the case of young infants, copious additions of water. The proportion of these various ingredients is in each case a matter of experimentation, and it matters not whether the milk portion of the ration contains 11.5 per cent. or 14.5 per cent. of solids. For every infant that is sacrificed by a deficiency of solids in milk probably fifty are sacrificed because of a lack of perfect cleanliness of the bottles and other appliances made use of in feeding them.

The amount of solids in milk is principally a commercial matter, and is a subject for little concern to health officers; but the feeding, the health and the care of a cow, and also the care of the milk from the time it leaves the udder until it enters the human stomach, are all of the utmost importance to the health of the public.

Great Britain and Paris, and we believe the rest of Europe, with their wise, beneficent, and efficient milk control, recognizing the injustice and impracticability of "legal limits," will not tolerate them.

That eminent authority upon milk analysis, Dr. Vieth, in the *The Analyst* for 1st Mo., 1886, says: "The difficulty of fixing standards for natural products is universally admitted. Nature does not allow herself to be confined in narrow bounds, but delights in pleasant variations. More than with a great many other natural products is this the case with milk, and I do not think it is saying too much, that a real 'standard' for any given sample of milk can only be furnished by a corresponding sample of the same milk taken before any interference has been possible."

Dr. James Bell, chief analyst at the Government Somerset House Laboratory, London, in the opening speech at the conference on food adulterations, held 1884, stated that "Parliament deliberately abstained from fixing limits of quality for natural products, whether in a raw or prepared state."

Dr. Bell further stated, "Whisky, gin, rum, and brandy are the only articles which are required to be sold at not less than a specific strength, unless otherwise declared at the time of sale," and then adds, "These spirituous liquors are in a different position to natural products, for being in all cases mixtures of manufactured spirit and water, the relative proportions are readily ascertainable." And further, in his work on *Analysis and Adulteration of Foods*, states, "The application of a uniform standard, which would operate alike fairly to consumer and vendor, to a natural product like milk, having a wide range of quality, is a problem of which a satisfactory solution may be almost regarded as impossible."

Dr. Bell also states, "It is frequently urged that certain limits, founded upon the analysis of samples of average quality, should be laid down and legalized for natural products, below which such products should be deemed to be not 'of the nature, substance, or quality of the article demanded;' but the adoption of such 'limits' might lead to grave difficulties. It is the opinion of practical men that it would be unwise to adopt any legislative measure with respect to limits of quality which would tend to discourage production and diminish the supply of any article of food. It would manifestly be an economic blunder, if, for instance, in order to raise the quality of milk by one-half of one per cent. on the non-fatty solids, the actual production were to be diminished by ten per cent. in quantity."

The Doctor has shown his foresight in these remarks, for under the high "legal limits" that have been enacted in parts of this country, there is no safety in marketing the product of native cows nor that of any breeds not remarkable for richness." The Society of Public Analysts, of England, have come to an agreement among themselves that milk should not be passed as genuine when the total solids fall below 11.5 per cent., of which not less than three per cent. should be fat. This carries with it in prosecutions whatever weight the court may esteem proper, but it does not, as with the "legal limits" of this country, prejudge the case.

Professor Barrister furnished a paper at the "Food Conference," above alluded to, in which he says, "In considering this act (the English Milk Act) you must bear in mind what was the distinct intention of the legislature," and this intention is still expressed by the Select Committee of 1874, which says: "Too high and rigid a standard has been fixed by some analysts, and no sufficient allowance has been made for some natural variations in milk; ten per cent. of milk solids may be more difficult to obtain under some conditions than twelve or fourteen per cent. under more favorable conditions. Allowance should, therefore, be made for these actual variations, which some purely scientific chemists seem to have overlooked." If it be a hardship that some *analysts* in England have set too high a limit, what of legislatures that give these unwarranted high limits the crushing weight of legal enactment?

That learned and practical scientist, the late Professor George H. Cook, who for so many years was the head of the New Jersey Experiment Station, wrote under date 3d Mo. 30, 1887, "The State law requiring twelve per cent. (total solids in milk) is not too high for general interest, but it should be so amended as to protect innocent parties from being charged with criminality on account of failure to which all are liable." The New Jersey law has since been amended with this object in view.

Averages and *limits* are ofttimes confounded, but the difference between them should be fully realized. If a legal or conventional limit for solids be set at the point of average, about half of the herds will, of necessity, fall below said limit, or, more correctly, the milk of nearly every herd will occasionally go below the limit, for herds take turns in supplying low results. Therefore limits, if fixed at all, should be placed at the lowest, not at the average point.

Dr. E. H. Jenkins, chemist at the Connecticut Agricultural Experiment Station, in his report for 1882, says: "It is a matter of great importance to know not simply what is the *average* composition of 'herd milk,' but what composition it *may have;* what are the limits within which pure 'herd milk' comes; and whether it is practicable to establish by law, or by regulation among dealers in milk, a standard of composition which shall distinguish pure milk from that which is watered or skimmed." And again, same report: "If we will establish a minimum limit for the percentage of solids and fat, which shall in no case condemn pure milk in any locality, we shall have to make it absurdly low," etc., thus recognizing the impropriety of establishing limits for solids, and at the same time bringing to view another serious objection to the establishment of legal limits, viz., the difficulty of prosecuting for the addition of water to milk so long as the altered milk continues above the legal limit. Excepting in cases of gross adulteration, the presence of water in milk is more surely indicated by the disturbance of the *relative proportions* of the solids fat, solids not fat, and the total solids than by the amount of either taken separately.

If cases were tried upon their individual merit without these hampering limits, experts could, as in other trials at law, give jurors the benefit of their knowledge and the results of their investigation, with their opinions as to the presence or absence of adulteration in each case. Under the system of legal limits, experts for the prosecution in their efforts to harmonize the law with common sense ofttimes certify what they do not know.

The legislatures above referred to having rendered parties penally liable for accidents affecting the quality of milk, and for careless, willful, or malicious acts of others, and to this wrong having added a requirement that a certain per centum of solids should be found in milk, notwithstanding its natural variations, it would at least have been expected that in the fixing of a limit for solids they would not have made it so high as to inflict punishment for the sale of pure, normal and wholesome milk; but this they have also done; thus adding injury to injury.

As before stated, analysts have for their own guidance in Great Britain adopted 11.5 per cent. as a suitable limit for solids in milk. The same standard has been set by the analysts of Paris, while at Amsterdam a standard of 11 per cent. has been adopted.

Twelve per cent. being the lowest "legal limit" established in the United States, I have compiled and herewith present the results of a large number of analyses, many of milk of certified purity, which conclusively demonstrate that nearly all herds produce milk that at times falls below said limit.

James Bell, in his "Analysis and Adulteration of Foods," pages 20-26, English Government Laboratory; 235 analyses of milk of known purity of individual cows, of which 52 were below 12 per cent., the lowest analysis being 10.31 per cent.; highest, 17.2 per cent. Average 12.88

Same authority, 24 samples herd milk of known purity, of which three were below 12 per cent.; the lowest analysis being 11.77 per cent.; highest, 14.69 per cent. Average 13.22

*Dr. Vieth results Aylesbury Dairy Co. Laboratory, 1881, average 12.80

*Dr. Vieth has stated, "The March and April *average* was only 12.7 and 12.8, and sometimes it came down to 12."

1882, 12,430 samples, 9120 cows, average . . 13.03
1883, 15,005 " average 12.97
1884, 14,235 " " 12.96
1885, 16,037 " " 13,06
1886, 17,269 " " 12.92
1887, 17,269 " " 12.92
1888, 18,611 " " 12.94
1889, 18 354 " " 12.94
1890, 20,624 " " 12.83
1891, 19,849 " " 12.76
1892, 23,865 " " 12.71

(Dr. Vieth's work continued by Droop Richmond, chemist.)

Dr. Vieth states, in *The Analyst* for 5 mo. '92, that the average solids, not fat, for the eleven years,—1881-1891, embracing 120,450 samples, was 8.8

Muller & Eisenstruch, Royal Agricultural Society, Sweden, daily analyses of milk, of known purity, of herd of fifteen cows, uniformly well fed, for one year; 4 times below 12 per cent. Average, ... 12.80

Dr. Hoffman, a herd of 104 cows not especially fed. Test for the entire year: 1st mo. 1st, till 5th mo. 25th, mornings' milk 11.8 per cent.; evenings' milk, 11.1 per cent.; 5th mo. 25th to 10th mo. 29th, mornings' milk 12 per cent.; 10th mo. 29th to 12th mo. 31st, mornings' milk 12 per cent.; evenings' milk 12.14 per cent. Average, ... 11.95

About 50,000 analyses made in the laboratory of the Danish Dairy Supply Co. The solids, not fat, were found to be about 8.70 per cent. to 8.80 per cent.

Denmark Experiment station, Copenhagen, report for 1891, '92, 240 cows lent by public spirited dairymen to test the relative value of various foods,—Experimental period, average solids not fat, 8 67; average total solids, ... 11.86

Post experimental period, average solids fat, 8.79; average total solids, ... 12.16

Massachusetts Agricultural Experiment Station, report for 1884, '85, '86, '87: 174 analyses of the separate milk, of known purity, from 11 cows, 11 fell below 12 per cent.

E. H. Jenkins.—Connecticut Agricultural Experiment Station, report of 1882: 208 analyses of herd milk from 127 herds largely grade Jersey, made in the 5th, 7th, 8th, and 10th months; 58 fell below 12 per cent. of which number the analyst believes the majority were pure. Average 12.40

New Jersey Agricultural Experiment Station, report for 1883, analyses of milk of known purity from 12 herds, taken MONTHLY throughout the year, highest analyses 15.47 per cent., lowest, 11.67 per cent., 6 of the 12 herds fell below the State "legal limit" of 12 per cent. during the year. One of the remaining 6 was a registered Jersey and Guernsey herd. Average . . 12.99

New Jersey Experiment Station, report for 1890, 42 analyses of milk of Ayrshire, Holstein-Frisian, and Short-Horn herds, for 8th month, 1890. 21 times fell below 12 per cent. total solids. Average 12.11

Same herds as above in 27 analyses made in 12th month, 1890, fell below 9 per cent. in solids, not fat, 18 times. Average total solids 12 55

H. B. Abbott.—Eight New Jersey herds, *weekly* analyses for eleven months, certificates of purity given. Seven herds upon one or more occasions fell below the State's "legal limit" of 12 per cent. Average 12.98

Pennsylvania State Board of Agriculture, report for 1885, p. 127.—Herd milk, Frisian cattle, various dates, total solids, 15.07, 15.98, 11.33, 11 59, 11.93, 11.64.

Again, p. 139.—Herd of 9 Devon cows, property of Dr. Cheston Morris, various dates, 12.46, 11.72, 13.3.

Marshall & Cochran, milk analysts, had under supervision throughout the year 1892 the milk of 250 herds supplying milk to Philadelphia, with results as follows:—Total number of analyses, 10,927; number below 12.5 per cent. of total solids, 3,352; below 12 per cent., 1,041: below 9 per cent. of solids, not fat, 9,160; below 8.5 per cent. of solids, not fat, 2,328. Of the 250 herds the milk of 245 did not at all times keep up to 12.5 per cent, and that of 210 herds did not keep up to 12 per cent. total solids. Samples were taken upon the arrival of the milk at station in the city.

The above showings do not at all represent the total number of times that a producer or vender of such milk would become amenable to the law because of its falling below twelve per cent. Only two of the reports are of *daily* analysis for an entire year, the remainder are weekly, monthly, or at intervals. It is evident that, had the other analyses been made daily, there would have been a large increase in the number of results below twelve per cent. Though the milk offered for sale by a producer or dealer should much exceed the limit for 364 days in the year, yet a fall below the limit for the remaining one day may be visited by fine or imprisonment, blasting an honest reputation, that has been of lifetime growth.

It is *important* that a limit adopted by chemists, and *imperative* that a "legal limit" shall not condemn honest, wholesome milk; because these limits are adopted in lieu of evidence of adulteration, presumably because the usual methods for the detection of criminalities are too laborious and too expensive to be bestowed upon dealers in milk.

This attempt to force an increased amount of solids in milk is a sanitary blunder. As before stated, "Under feeding" is now almost unknown; "intensive feeding" being the order of the day. The milk of a cow reasonably fed is evidently

more wholesome than that of one thrown into a feverish and congested condition by large rations of highly concentrated foods. Likewise the milk of the first five months of the cow's milking period, though low in solids, is a more wholesome food than that of the remainder of the milking term. Yet these mistaken sanitarians condemn the milk of the earlier period as adulterated, and accept that of the latter because higher in solids.

Dr. Bell says, "For a long time it was contended that cows which gave milk that contained less than 11.5 per cent. solids were either diseased or starved, but this notion may now be said to be dispelled, for the more the matter has been investigated, the more has such a position been found untenable."

Neither is it possible to materially alter the solids in milk by high feeding, as has been demonstrated by a most thorough and exhaustive experimentation conducted during the past five years in Denmark, as previously referred to. There were under test 1152 cows, divided into 112 lots, on nine farms in different parts of the country. The Danish report states, "These changes (in ration) have practically not at all been traceable in the chemical composition of the milk." Again, "The lesson taught by them is that sufficient nutriment being provided for a cow in all cases, the food will affect the quantity of the milk alone, and not its quality."

The remaining objectionable feature, above recited, as embraced in some of our American legislation, is the prohibition of the sale of skim milk. This result has been brought about by selfishly interested parties, who for the accomplishment of their purpose have decried this valuable article of diet. That in skim milk is found an economical, wholesome, and bone and sinew making food has nevertheless long been recognized by the farming class, generation after generation having thriven and grown strong upon it. Food scientists also have of latter years demonstrated that cost, digestibility and nutrition considered, skim milk is without a peer in the list of animal foods. Trade considerations also demand a free and unrestricted opportunity for the sale of skim milk. The demand for cream is a reasonable and legitimate one, and the dealer must and will meet it. Now, how is the dealer to procure cream where the sale of skim milk is prohibited or so restricted that partial or entire prohibition ensues? The procuring of cream from the country is expensive, difficult and often unsatisfactory. Without doubt the tendency of the law is to urge the dealer to a robbing of the cream from the milk sold as whole milk.

The demand for cheap milk is positive and general. It is a demand that cannot and should not be put aside. A large part of our population must have cheap milk for general family use, or be restricted to little more than sufficient for the infantile portion. Again: the same family will at one time buy cream and at another prefer to purchase skim milk, as the requirements of the table vary from day to day; but these laws interfere with the right of the purchasing public thus to exercise a prudent and praiseworthy economy, by obliging parties to purchase large quantities of whole milk in order to secure cream, when only cream is wanted; and by forbidding the opportunity to purchase the cheaper skim milk when such milk meets their wants. Skim milk can be supplied at half the price of whole milk, and if this were regularly and systematically done, and the public properly acquainted with its value as food, it is probable that the demand for the milk product of the dairies of our country would increase two-fold. In meeting the undeniable demand for cheap milk, laws prohibiting and restricting the sale of skim milk enter in as a most unfortunate, meddlesome, and disturbing factor; for while they encourage the dishonest dealer to rob the whole milk of a portion of its cream, whereby *he* is supplied with a cheapened article, they prevent the *honest dealer* from supplying himself with cheaper milk, which he could do by skimming, and would then gladly sell the skimmed milk as such at a reduced rate. Thus the unprincipled dealer is enabled to monopolize that portion of the public custom that demands cheap milk, and is placed in position to drive the honest dealer out of the market, from lack of a general patronage and support.

Advocates of these laws contend that if skim milk is altogether prohibited, the

admixture of it with whole milk is thereby prevented, whereby a source of adulteration or reduction is avoided. What force can there be in this argument; for whole milk is readily convertible into skim milk, and whoever possesses whole milk is able to supply himself with skim milk *ad libitum*, and, as has been shown, the law itself urges upon him the temptation to skim the whole milk in the effort to obtain cream.

Before such legislation as has been above discussed be extended to other cities and states, it would be well to investigate its effectiveness where now enacted. It will be found that these laws are retained upon the statute books only so long as they are not enforced; that they will not bear the light of investigation nor to be tested by science or justice; that they belong to the night and not to the day, to the Middle Ages and not to the Nineteenth Century.

As an instance of the folly of such legislation, an expert in milk analysis recently purchased milk promiscuously of thirty retail milk dealers in Boston; analysis revealed that twenty-two of the thirty samples fell below the Massachusetts legal limit of 13 per cent.

Again, the ridiculous Pennsylvania Milk Act of 1885, is, we believe, practically without enforcement anywhere in the State; and were enforcement attempted its prompt repeal would be insured.

If health officers would confine themselves to their legitimate calling and not attempt to regulate commercial frauds, their work would be much simplified.

He who wittingly jeopardizes the health of the public, is a fit subject for criminal procedure and condign punishment, and it is proper that the health officers should be diligent in bringing such to justice; but parties guilty of a commercial fraud only can be more effectually reached by other methods. A valuable illustration of enlightened food control is to be met with in Paris, where each police station receives samples of food, etc.; these samples are analyzed at the Municipal Laboratory gratis, and certificates of analysis given the furnishers of samples. M. Girard, the *Chef du Laboratoire*, states: "Thus enlightened by certificates of analysis they (the buyers) can change the furnisher, and seek elsewhere such food and drink as would be worth the price they are willing to give, and that will repay the trouble of their search. This abandonment of the adulterating vender by his cheated client constitutes for the former a pecuniary punishment not less severe than the fines inflicted in courts."

Professor Stephen P. Sharpless, State Assayer of Massachusetts, is quoted in bulletin No. 25, p. 37 of the U. S. Department of Agriculture, (division of Chemistry) thus: "A law upon this subject (the adulteration of foods) must be simple, easily understood, and general in its application, and it should not attempt to control all commercial frauds but only such as are detrimental to health."

If health officers would direct the attention of the public more to the necessity of absolute cleanliness in all that pertains to or comes in contact with milk, instead of devoting almost all their energies to attempts to increase the amount of solids therein, they would far better serve the interests of health and sanitation, and would throw a real safeguard around infantile life.

Pemberton Dudley, M. D., member of the Penna. State Board of Health, writes as follows in regard to the relation between the milk supply and infant mortality: "It is very easy for a physician, speaking from the history of a few cases in his own practice, or perhaps from some medical tradition, or 'old wives' fables,' to attribute the disease (cholera infantum) to impure air, unripe fruits, unwholesome milk, etc., but to prove that any considerable number of cases arise chiefly from these causes, is quite another matter." And again: "If it be absolutely necessary to place the sale of milk under additional restrictions, let it be so; but we cannot justly urge, as a reason for such restriction, the high mortality-rate among infants, unless we first demonstrate, far more conclusively than it has yet been done, that milk, pure or impure, is to any great extent the cause of such mortality."

Dr. Leffmann, Hygienist and Food Inspector to the State Board of Agriculture of Pennsylvania, and otherwise so largely experienced in this line of inves-

tigation, still fully endorses the following as by him given to one of our local dailies in the year 1890: The recent heavy mortality among young children being referred to, together with the prevalent public sentiment that cholera infantum is largely caused by low grade milk, the doctor said that he thought there was very little genuine cholera infantum about, and that the disease called by that name is really an intestinal irritation which, when it is due to milk at all, is caused by a decomposition of the milk after it leaves the farm, and not to any adulteration. "I do not believe," he said, "that those who claim that cholera infantum is due to milk adulteration really mean what they say. There is not a particle of a doubt that milk does often cause intestinal disorders in young children. When milk begins to decompose there is a poison formed called tyrotoxicon. This may be formed within a few hours after the fluid leaves the cow, and is by no means the result of any adulteration on the part of the farmer or dairyman."

In this connection may be quoted the very sensible remarks of Dr. Townsend, Health Officer of the District of Columbia, as given in Bulletin No. 32, p. 64, of the U. S. Department of Agriculture above named: "Although the white population is estimated as being twice that of the colored, yet it will be seen that the deaths of the colored infants exceed the white by 200. This material difference in the death rate may be charged, to a great extent, to the location of the colored people in alleys and unhealthy parts of the city, and their unsanitary surroundings; while there is no doubt that a very large proportion of these children die in consequence of being fed improper and unhealthy food, especially cheap and badly prepared condensed milk, and cow's milk which has been allowed to stand to the point of acidity, after having been kept in vessels badly or unskillfully cleaned. It is a well-known fact that infant mortality in the country is much less than that in the cities. This difference cannot wholly be attributed to the unsanitary conditions of the city. Much of it can be laid to the unnatural custom of urban mothers in depriving their offspring of the food nature has prepared. It is now a well established fact that no artificial food has as yet been manufactured which will convey the same amount of nutriment to the child, without causing functional derangement, as mother's milk."

Victor C. Vaughan, Ph. D., M. D, Professor of Hygiene and Physiological Chemistry in the University of Michigan, in his work on "The Chemical Factors in the Causation of Disease," (p. 136), says: "There are many germs, any one of which, when introduced in the intestines of the infant, under certain favorable conditions, may produce diarrhœa." Further, (page 139), he says: "That tyrotoxicon is one of the causes of the violent choleraic diarrhœa of children there can scarcely be a doubt." And again, (p. 137): "The chief reason why the breast-fed child has a better chance for life than the one fed upon cow's milk lies in the fact that the former gets its milk germ free."

All breeds of cows may be safely trusted to perform their part well in the production of wholesome milk. Let us see that diseased individuals are eliminated from herds, that the drinking water is pure, that a sufficient and not excessive supply of normal food is fed, that stables are abundantly supplied with air and light, that persons suffering from contagious diseases take no part in the handling of the milk, and above all that the most scrupulous cleanliness be rigidly observed at every stage from the cow's udder to the human stomach, and the commercial aspect of the question may, after being illuminated by the light of scientific investigation, be safely left to the buyer and the seller.

GEORGE ABBOTT.

Annotations.

WE are pleased to note that the Franklin Square Sanitarium has come into the pale of ethical medical institutions. The very objectionable advertising to the public has been stopped; and the character of the medical gentlemen who have now associated themselves with the work is such as to warrant its success. The sanitarium treats all forms of narcotic habit.

SALPINGITIS

A VALUABLE contribution has been recently published by Dr. Landau, of Berlin, translated into the French by Pozzi (Archives de Tocologie et de Gynècologie, Mars, 1893, p. 216), with the above title.

Space will not permit here to give it in full, hence nothing more than an epitome can be given. In speaking of the pathology of salpingitis, he says that it has a morbid anatomy peculiar to itself; that it is the only tubular structure in the human body liable to frequent suppurative occlusion. Modern science, he reminds us, has enabled us to diagnose this condition with almost a certainty in every case. It is nearly always unilateral, while hydrosalpynx is bilateral.

He speaks of its frequency after abortion and gonorrhœa, and places inspection, percussion, and puncture in the first rank as diagnostic resources. Clinically, he says it has no unique type. It may be divided into two forms, the acute and chronic.

Acute Salpingitis —This may spontaneously cease of itself. As a rule we should interdict surgical measures in this variety, unless in special emergencies. The physician, he adds, is competent to deal with it by rest, local and general measures.

For violent, colicky pains, the narcotics serve an invaluable purpose. Opium in suppositories, above all, is highly commended. Opium, he alleges, is infinitely superior to morphine in diseases of the lower abdomen, for calming properties, control over vomiting and peristalsis. We may apply cataplasms over the abdomen, cold or warm, according to the individual preference of the patient.

When the pain is chiefly local and very severe, free leeching is highly recommended. But in cases of blenorrhagic salpingitis, after the acute symptoms have subsided, it may now become a question as to extirpation of the diseased tube. He advises strongly as a rule against surgical intervention in the acute stages, and cites several fatal results after interference in the presence of high fever.

In the quiescent stages, when the pus has lost its virulence and the walls have contracted moderate adhesions, is the time for surgical relief, though he admits not a few of these cases will undergo a cure by absorption, or spontaneous drainage through the vaginal outlet.

Chronic Salpingitis.—In the treatment of this we must carefully note objective conditions and subjective symptoms. We must note the individuality of our patient. He says that too frequent operations are much more to be condemned than the abuse of internal medication. We are now in a transitional epoch, when less frequent resort is had to the bistoury. All radical operations are not radical in their results. Inflammation often has reached the peritoneum, so that when we remove the tube many foci of this process yet remain. Without speaking of the dangers which always attend a laparotomy, with the new disorders which it may provoke, we may mention hernia, floating kidney, etc.

Pelvic neuralgias and many troublesome hysterical phenomena have been known to follow an abdominal section. Indeed, he cites a startling array of very serious functional and organic disturbances which he has seen follow operations on the uterine appendages, and castration or spaying. Venereal desire is generally lost and cöitus is borne with repugnance. The health of many of our patients, they will tell us, was good before operation, but after it their misery was quite insufferable; and for these neural perturbations there is no known cure. He says that he regrets to find himself on this question of spaying in direct opposition to many surgeons; but the painful and numerous examples of invalidism which he has witnessed, compel him in conscience to speak out. We must not condemn the ablation of the tubes, for it is an excellent and valuable operation; but its performance is seldom called for.

For chronic salpingitis, he recomends orthopædic treatment, massage, catheterism, lavage, curettage and electricity, which measures in his hands have never failed to relieve and cure even the most aggravated cases. He describes in detail and with commendable clearness the technique of his treatment, which should be patiently and diligently tried, before sanguinous measures are advised.

NOTE BY THE TRANSLATOR.

That a pus-tube always demands an abdominal section, is an assumption as preposterous as it is dangerous. This I have had an opportunity to demonstrate recently to my full satisfaction, in a case which I was called to see by Dr. G. W. Gaudineer of this city. Patient a private *demi-mondaine*, after an abortion which she had induced, developed a fullness on the left side, with high fever, a ballooned abdomen and intestinal obstruction. Bowels had not opened for six days.

Placed under full anesthesia of chloroform. Large pus-tube mapped out readily when the muscles were relaxed. Within an hour after regaining consciousness had a large evacuation. Mercurial inunction over entire abdomen recommended; hot and repeated poulticing was practiced, with enough morphine to relieve pain. For the next week had a copious sero-purulent discharge from vagina.

In two weeks pyo-salpinx had wholly vanished and patient has quite recovered her usual health. T. H. M.

WOMAN'S MARVELLOUS TOLERANCE TO SURGICAL OPERATIONS.

IN a general way, it is a well recognized fact that women bear surgical operations of any description, as a rule, better than men; the only exception, if any, is kelotomy for strangulated hernia.

Hence many surgeons will oftentimes advise and undertake operations on the female, which they would not hazard in men. This is important to bear in mind as a clinical point, which, if observed, may lead to the saving of many lives, which otherwise would be sacrificed by a needless timidity.

The following is a case to the point from Prof. Roux of Lausanne.[1]

Mlle. B. aged forty-seven, entered the hospital with prolapsus of the uterus January 13th, 1888. For twenty years she had oppressive feelings in the lower pelvis, with pain in the back.

In 1884 was attacked by a furious bull in a field, and thrown twice to the ground, thereby having had several ribs fractured and a hernia produced. Soon after this, hernia of the uterus through the vagina. Uterus remains outside the vulva, equally in bed as well as on her feet.

First operation January 17th. Anterior colporraphy plastic perineal of the "Emmet-Lawson Tait Sanger" method. Union by first intention.

February 3d, Alexander's operation.

April 4th. Uterus yet making its way downward and threatening to again prolapse, the vagina was denuded of its mucous membrane, as high up as possible.

Yet a tendency to relapse May 12th, when the labia were freely stripped of of their mucous membrane and sealed with sutures.

December 26th. Patient returned to hospital, this time, because she had a large prolapse of the anus, and the propped uterus pressed with great force against the rectum.

The anus was now deeply cauterized. As patient recovered from this, she commenced to suffer from a severe pain over the left lumbar region, where there was a large, painful movable mass, which was diagnosed as a malignant disease of the kidney. March 9th, 1889, a nephrectomy was performed, by which the diseased organ was removed. The wound healed by primary union, and the patient made a good recovery.

Now, again, the uterus commenced to give further trouble. By pressure on the rectum and bladder, it would interfere seriously with their function, causing dysuria and more voluminous prolapse than ever.

At this time, both the operator and patient commenced to despair. The unfortunate woman now steeled herself for another capital operation, and on the 9th of May the uterus was amputated.

She quitted the hospital in good condition on June 12th.

But her reprieve was short, as she returned again in September with large nodosities occupying both inguinal regions.

Diagnosis: Recurrent metastatic cancer of uterine appendages.

December 10th. Laparotomy. Found a mass of silk ligature in the stump

[1] Revue de Medicine, De La Suisse Romande, 20 Mars, 1893.

of the cervix, with cancer in both ovaries and tubes. Result of operation very good, left the hospital Jan. 1st, 1890.

September 4th, 1890, returned to the hospital with a neoplastic formation in the cicatrix of the wound.

It was decided not to operate now, and she went home; but returned again, January 16th, 1893, with threatened rectal obstruction. Now Bryant's operation of lumbar colotomy was performed with the greatest relief. Left the hospital for home greatly improved in health.

This is as far as the case has been traced.

It is one of those examples which so clearly illustrate what modern surgery has done and is doing for that class of cases, formerly doomed as hopeless, but which now, by aids within our reach, may be made comfortable, life lengthened, and in not a few instances a practical cure is effected. T. H. M.

ELECTRICITY.—Although it has long since passed the period of fashionable novelty, electricity grows steadily in favor as a therapeutic agent. The great remedial powers of the various currents are being studied by many physicians and applied with a precision impossible in the misty, half-knowledge of adozen years ago. Dr. Massey has contributed a paper to the Philadelphia County Medical Society this week, giving a summary of the work done in his private hospital. This, with other papers pertaining to neurology will shortly appear in one of our special editions. Dr. W. H. Walling has been making numerous applications of the currents to special parts, and urges strongly the importance of thus concentrating the action and confining it to the point where it is needed.

Book Notices.

METHODS OF PRECISION IN THE INVESTIGATION OF DISORDERS OF DIGESTION. Read before the Cincinnati meeting of the Mississippi Valley Medical Association, Oct. 13, 1892. By J. H. Kellogg, M. D. Modern Medicine Publishing Co., Battle Creek, Mich., 1893.

A plea for the application of exact chemical analytic methods in the diagnosis of gastric disorders.

DIET FOR THE SICK. By Miss E. Hibbard, Principal of Nurses Training School, Grace Hospital, Detroit, and Mrs. Emma Drant, Matron of Michigan College of Medicine Hospital, Detroit; to which has been added Complete Diet Tables for various diseases and conditions as given by the highest authorities. Detroit, Mich., The Illustrated Medical Journal Co., Publishers. Paper, 74 pages. Price, postpaid, 25 cents; 6 for $1.00.

HISTORY OF THE LIFE OF D. HAYES AGNEW, M.D., LL.D. By J. HOWE ADAMS, M D. With fourteen full-page portraits and other illustrations. In one large royal octavo volume, 376 pages, extra cloth, beveled edges, $2.50 net; half-morocco, gilt top, $3.50 net. Sold only by subscription. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This is a work that will find a cherished place in many a library; that will be treasured by many a friend to whom that great, warm-hearted man was dear. The story of his life is one that ought to be read by every young physician; a blameless life; where every step on the upward climb was won by honest work; never by the charlatan's tricks, or the reporter's puffing.

This is not a book for review: it is one that every reader of this journal can read and ponder over; and rise up a better man for it.

A TREATISE ON THE THEORY AND PRACTICE OF MEDICINE. By American Teachers. Edited by William Pepper, M. D., LL. D., Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania. Vol. I. For sale by subscription only. Price per volume, cloth, $5; Sheep, $6; half Russia, $7. W. B. Saunders, Publisher, 913 Walnut Street, Philadelphia, Pa.

The first volume of this valuable work is now in the hands of the profession. The cyclopedic method gives the best obtainable results in the construction of such books, and the present volume shows this admirably. One advantage thereby obtained is that the most eminent teachers can be induced to write single articles, who yet could not take the time to prepare complete treatises. Throughout the work, those parts treating of pathology are especially commendable; while the therapeutics is conservative uniformly. We recommend the work to our older readers especially, as being rather suited to the experienced practitioner than to the student.

The Medical Digest.

LACTATE OF STRONTIUM.—While the the salicylates answer all purposes in acute rheumatic fever, they are of little value in the non-febrile forms. Two such cases have been under my care during the past winter. As long as they took sodium salicylates in full doses, the symptoms were reduced to a minimum, but immediately returned on the discontinuance of the drug, which, moreover, had a deleterious effect on the health. I then directed these patients to take the solution of strontium iodide (Paraf-Javal,) beginning with four drachms daily. Improvement followed, and the dose was gradually reduced to one-half. The effect was very good; the symptoms gradually subsiding, while the general health improved. Both patients resided in damp houses; and the rheumatism showed a tendency to recurrence, though at intervals much longer than when under the salicylates.—*Waugh.*

The *Wiener Medicinische Presse*, No. 14, contains the following report:—

"Balneologen-Congress.—At the XV public meeting of the Berlin Balneological Society, held March 10th to 14th, 1893, Professor Leyden stated that Jasper's diabetes-pills did not have any influence on the course of the disease. He had made trials with Levulose (Diabetine-Schering), a certain kind of sugar, and found that this product was made use of to more advantage in the human economy than cane-sugar and other carbo-hydrates, and that the advantageous use was increased with the length of time the article was taken, while for cane-sugar the opposite condition obtains. This result is quite satisfactory, as it proves the feasibility of improving the nutrition of patients with diabetes of medium intensity."

SALOPHEN.—When the preparations of salicylic acid were first known in medical practice, it was thought a specific had been discovered for the treatment of rheumatism. As time passed it was found that the salicylates failed to meet all the requirements of an anti-rheumatic; they frequently caused disturbance of the stomach, nervous disorders, irritation of the kidneys and weakness of the heart. Accordingly, when salol, the phenol-ether of salicylic acid, was brought forward by Sahli as a substitute devoid of these disagreeable effects, it met with ready acceptance by the profession; but it was soon found that owing to the quantity of carbolic acid in its composition salol gave rise to carbolic acid poisoning in some cases, if employed in larger doses. To obviate these toxic effects, a new body was constructed, in which the phenol element of salol is replaced by an innocuous substance, and to this resulting compound the name salophen has been applied.

Although only recently introduced, salophen has already demonstrated its value as an anti-rheumatic in many hands. Dr. W. H. Flint (*N. Y. Med. Jour.*, July 30, 1892) has employed the remedy in six cases of acute articular rheumatism, and concludes that we possess in salophen a remedy equally as the other salicylates to control the symptoms of acute rheumatic arthritis, but devoid of their tendency to weaken the heart's action, to disturb the stomach, and to produce albuminuria and smoky urine. Prof. Hobart A. Hare, of Philadelphia (*Therapeutic Gazette*, Jan. 1893,) speaks very favorably of the action of salophen, in cases of severe neuralgia and myalgia of rheumatic origin, and considers the drug an important addition to the materia medica. Prof. Guttmann, of Berlin (*Berlin Klin. Woch.*) has employed it in cases of acute articular rheumatism and found that it exerted very beneficial effects, especially in recent cases; the pains and swelling of the joint being rapidly relieved. Dr. Frolich (*Wien. Med. Wochenschr.*, July, 1892) states that the remedy did not fail in one out of thirty cases of acute rheumatism, and prefers salophen to the salicylates because (1) being decomposed in the intestine it does not irritate the stomach; (2) it can be given in large doses and for a long period without unpleasant effects; (3) it is tasteless. Dr. Edmund Koch ("Inaugural Dissertation") has recently reported a large number of cases of acute rheumatism treated with salophen, and comments upon the rapidity with which it removed the pains, fever and swelling. In various nervous affections, headache, migraine, sciatica, it proved very effi-

cient, rapidly removing or at least relieving the pains, and this without disagreeable after-effect. These remarkable analgesic properties of salophen are also confirmed by Dr. Caminer (*Therap. Monatshefte*, Oct. 1892) who obtained excellent results from its use in cephalalgia, hemicrania, trigeminal neuralgia and sciatica.

EFFECTS OF TRIONAL AND TETRONAL ON THE INSANE.—These new remedies both have a marked hypnotic and sedative action, but trional appears to be the more serviceable as a hypnotic for the insane. On the other hand, small doses of tetronal appear to give the best results as a sedative. As a rule, the hypnosis which is produced is calm and quieting and resembles very closely natural sleep. In a few instances unpleasant after effects were noted, but they did not continue long and were not at any time alarming. They do not depress the heart's action.

In the majority of cases fifteeen grains (gramme 1) of trional given in hot milk at bedtime will produce sleep of from six to nine hours' duration, which is not accompanied by dreams. The time it takes to produce this effect, is, in favorable cases, from fifteen to forty-five minutes, although it may be prolonged to over two hours. With tetronal it was found that generally fifteen grains (gramme 1) were required to obtain the same results, and as this remedy is twice as expensive as trional the latter is to be preferred, as a rule. Both of these drugs have the effect with some patients of producing sleep for two nights after a single administration.

Their sedative action appeared to be most satisfactory, and with few exceptions did not produce a drowsy or stupid condition. The dose of trional as a hypnotic is from ten to thirty grains (grammes .66 to 2.) but it is advisable to begin with fifteen grains (gramme 1). As a sedative ten or fifteen grains (gramme .65 or 1.) at least are required, but in some patients even forty-five grains (grammes 3) will not produce any effect. The dose of tetronal as a hypnotic is from five to thirty grains (grammes .33 to 2.) but in the majority of patients fifteen grains (gramme 1) will be required to procure a satisfactory sleep. As a sedative five or ten grains (gramme .33 or 66) given once or twice a day will generally prove to be of benefit.—*Mabon, Am. Jour. of Insanity.*

FOR bronchial catarrh cocillana has recently been warmly recommended. In eight cases of acute bronchitis I gave this drug a trial. In six the effect was beneficial; better, it seemed to me, than ipecacuanha, with which cocillana has been compared. In two cases it failed. Both these were fat and plethoric, over fifty years of age and very liable to such catarrhs. Ammonium chloride and bromide, with Dover's powder, proved here more effective than the cocillana. My conclusion was that the latter is one of our best remedies in acute and chronic bronchial catarrhs.—*Waugh.*

FOR COUGH:—

℞. Tinct. lobeliæ
Tinct. sanguinariæ canadensis..aa ʒij
Syrup. senegæ . . . . . ʒiv
Morphinæ sulphatis. . . . . gr. ss
Syrupi. . . . . ʒj
Infus. pruni virginianæ q. s. ad ʒviij
M. Sig.—Dose, a teaspoonful *pro re nata.*

Claiborne, Va., Med. Monthly.

DIABETINE.—*H. von Hebra's* clinical reports, which were confirmed by many other researches and experiences, describe Diabetine as a saccharine food that can be taken freely and without injury, and most nearly approaches the ideal carbohydrate food indicated in diabetes.

Minkowski stated at the recent Congress of Internal Medicine in Leipzig, that the results of his research fully warrant the hope that the introduction of Diabetine in the diet of diabetic patients will prove of great value.

Dr. Waugh has given Diabetine to a gentleman who had recovered from diabetes under the use of lactate of strontium. No return of the diabetes has occurred, although he has employed diabetine for several months.

ALEXANDER DUKE calls attention to stretching the sphincter ani as a remedy for chloroform collapse. A child under chloroform was apparently dying, and artificial respiration and cold affusions had failed. The operator introduced the thumb into the anus and drew it forci-

bly back towards the coccyx. The child gave a loud cry, and at once began to struggle. As the sphincter is the last to succumb to anesthesia, its reflexes are the last that can be stimulated —*Med. Times.*

FOR HEADACHE OF GASTRIC ORIGIN:—

℞. Salophen . . . . . ʒj
Div. in chart. no. . . . . vj
S.—One every half hour until better.
—*Waugh.*

FOR chronic diarrhea, Hughson (*Va. Med. Mo.*) recommends salicine, gr. vj, every four hours.

News and Miscellany.

Mayor Stuart has appointed the commission to select a site for the cholera building: Dr. W. H. Ford, of the Board of Health; Dr. J. R. Clausen; Dr. E. O. Shakespeare; Dr. W. M. Welch, of Municipal Hospital, and J. T. Windrim.

Changes in the Medical Corps of the U. S. Navy for the week ending April 22, 1893.—Medical Director A. C. Gorgas from the Naval Hospital, Philadelphia, Pa., and to special duty, Philadelphia, Pa.; Medical Director D. Kindleberger from special duty, Philadelphia, Pa., and to the Naval Hospital, Philadelphia, Pa.; Assistant Surgeon A. B. Pusey ordered to the Naval Hospital, Norfolk, Va.; Assistant Surgeon Henry La Motte detached from the U. S. S. Vesuvius, and to the Naval Hospital, Norfolk, for treatment; Assistant Surgeon C. W. DeValin detached from the Naval Hospital, Norfolk, Va., and to the U. S. S. Vesuvius; Surgeon John C. Wise detached from the U. S. S. Alliance and to the Naval Hospital, Norfolk, Va., for treatment.

Dr. Henry Leffmann recently published the results of analyses of a number of malt extracts, showing that salicylic acid is present in a majority of these preparations. As this acid inhibits the action of diastase, it is obvious that its presence in the lighter, liquid extracts would be objectionable. The clinical results obtained from Hoff's extract (Tarrant) have been so good, that we requested an explanation, and received the following: This extract is imported in barrels. These are returned to Germany; and, before being refilled, are washed out with a solution of salicylic acid. Small as is the quantity remaining on the inside of the barrel, it suffices to give the reaction of salicylic acid to the delicate tests applied. That only a trace of the acid exists, is shown by the following extract from a report made by Frederick P. Power, Professor of Pharmacy and Materia Medica, University of Wisconsin:

"With regard to the salicylic acid in the malt extract, I would say that the amount is so very small that I do not think it can be considered as at all injurious to the preparation, or in any way detrimental to those who use it. The amount was indeed so small that I did not attempt its quantitative estimation. . . . I am personally quite confident that any medical authority would confirm my opinion, respecting the harmlessness of the substance, in the amount in which it is contained in the preparation." (Signed) F. B. POWER.